

Amendments to the Claims

Listing of Claims:

1. (Withdrawn) An image display apparatus comprising:
 - (a) a luminous device composed of two-dimensionally arrayed plural semiconductor lasers;
 - (b) a parallel-conversion optical system for directly inputting beams output from the luminous device and converting the beams into substantially parallel beams;
 - (c) an optical switch for inputting beams output from the parallel-conversion optical system and modulating the beams; and
 - (d) a display optical system for inputting beams modulated by the optical switch in order to display an image.
2. (Withdrawn) The image display apparatus of claim 1, further comprising a beam-conversion optical system between the parallel-conversion optical system and the optical switch, for converting a section size of the beams into a light-utilization size for the optical switch.
3. (Withdrawn) An image display apparatus comprising:
 - (a) a luminous device composed of two-dimensionally arrayed plural semiconductor lasers;

- (b) a beam-conversion optical system for directly inputting beams output from the luminous device and converting at least one of a beam section shape and a beam section size of the beams;
- (c) an optical switch for inputting beams output from the beam-conversion optical system and modulating the beams; and
- (d) a display optical system for inputting beams modulated by the optical switch in order to display an image.

4. (Withdrawn) The image display apparatus of claim 3, further comprising a parallel-conversion optical system between the beam-conversion optical system and the optical switch, for inputting the beams output from the beam-conversion optical system and converting the beams into substantially parallel beams.

5. (Withdrawn) The image display apparatus of claim 1 or 3, wherein each of the two-dimensionally arrayed plural semiconductor lasers is one of a semiconductor laser outputting a multi-mode laser beam and a semiconductor laser outputting a laser beam of wide spectrum.

6. (Withdrawn) The image display apparatus of claim 1 or 3, wherein the luminous device includes arrayed integrated semiconductor lasers.

7. (Withdrawn) The image display apparatus of claim 1 or 3, wherein the luminous device includes a surface-emitting semiconductor laser.

8. (Withdrawn) An image display apparatus comprising:

- (a) a luminous device composed of arrayed plural discharge lamps;
- (b) an optical switch for inputting beams output from the luminous device and modulating the beams;
- (c) a parallel-conversion optical system for inputting one of the beams output from the luminous device and beams modulated by the optical switch, and converting input beams into substantially parallel beams; and
- (d) a display optical system for inputting one of beams output from the parallel-conversion optical system and the beams modulated by the optical switch in order to display an image.

Claims 9-12 (Cancelled).

13. (Withdrawn) The image display apparatus of claim 8, further comprising a controller for controlling each of the plural light sources.

14. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device is an aggregation of light sources having different spectral distributions.

15. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device is an aggregation of discharge lamps, a gap length of each of which is less than 4mm, outputting parallel beam luminous flux of lumen equal to and more than several hundred, and the parallel-conversion optical system is an aggregation of reflectors making beams output from each of the discharge lamps be parallel beams.

16. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device is able to change at least one of a beam section shape and a beam section size.

17. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device is able to change a light source type.

18. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device is able to change an array shape of light source.

19. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device allocates light sources having different sizes.

20. (Withdrawn) The image display apparatus of claim 8, wherein the luminous device includes a lamp in which a part of a discharge tube is used as a reflector.

21. (Currently Amended) An image display apparatus comprising:

(a) ~~a diode~~diodes for emitting beams of different wavelengths in sequence;

(b) an optical switch for inputting substantially linearly polarized beams output from the light source and modulating the substantially linearly polarized beams; and

(c) a display optical system for displaying beams modulated by the optical switch.

22. (Withdrawn) The image display apparatus of claim 21, wherein the image display apparatus is a projection type image display apparatus and the light source is used for the projection type image display apparatus.

23. (Previously Presented) The image display apparatus of claim 22, further comprising:

- (a) a light source for color image;
- (b) a light source for luminance image;
- (c) an optical switch for color image for creating a color image by using the light source for color image;
- (d) an optical switch for creating a luminance image by using the light source for luminance image; and
- (e) a combining optical system for combining the color image created by the optical switch for color image with the luminance image created by the optical switch for luminance image in order to create a combination image;

wherein the diode for emitting beams is used for at least one of the light source for color image and the light source for luminance image.

24. (Withdrawn) The luminous element of claim 21, wherein the light source is used for a direct-view type image display apparatus.

25. (Withdrawn) The luminous element of claim 21, wherein the light source includes an electro-luminescent element.

26. (Previously Presented) The luminous element of claim 21, wherein the diode includes a light emitting diode element.

27. (Currently Amended) An image display apparatus comprising:

- (a) ~~a diode~~ diodes for emitting; and
- (b) a display optical system for displaying different wavelength beams modulated and output at the ~~light source~~ diodes in sequence.

28. (Previously presented) The image display apparatus of claim 27, wherein the image display apparatus is a projection type image display apparatus and the diode is used for the projection type image display apparatus.

29. (Previously Presented) The image display apparatus of claim 28, further comprising:

- (a) a light source for color image;
- (b) a light source for luminance image;
- (c) an optical switch for color image for creating a color image by using the light source for color image;
- (d) an optical switch for luminance image for creating a luminance image by using the light source for luminance image; and
- (e) a combining optical system for combining the color image created by the optical switch for color image with the luminance image created by the optical switch for luminance image in order to create a combination image;

wherein the diode for emitting beams is used for at least one of the light source for color image and the light source for luminance image.

30. (Withdrawn) The luminous element of claim 27, wherein the light source is used for a direct-view type image display apparatus.

31. (Withdrawn) The luminous element of claim 27, wherein the light source includes an electro-luminescent element.

32. (Previously Presented) The luminous element of claim 27, wherein the diode includes a light emitting diode.

33. (Original) An image display apparatus comprising:

- (a) a light source for color image;
- (b) a light source for luminance image;
- (c) an optical switch for color image for creating a color image by using the light source for color image;
- (d) an optical switch for luminance image for creating a luminance image by using the light source for luminance image; and
- (e) a combining optical system for combining the color image created by the optical switch for color image with the luminance

image created by the optical switch for luminance image in order to create a combination image.

34. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed ~~light sources~~diodes outputting different wavelength beams in ~~time sharing~~sequence.

35. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed ~~light sources~~diodes outputting different wavelength beams in ~~time sharing~~sequence, and

(b) an optical switch for inputting the different wavelength beams output from each of the arrayed ~~light sources~~diodes of the luminous device, and modulating input different wavelength beams in ~~time sharing~~sequence.

36. (Withdrawn) The image display apparatus of claim 34 or 35, wherein the luminous device is composed of a plurality of luminous devices in which a plurality of semiconductor lasers outputting same wavelength beams is arrayed, and each of the plurality of luminous devices operates in time-sharing in order to output a beam in time-sharing.

37. (Withdrawn) The image display apparatus of claim 34 or 35, wherein the luminous device is composed of arrayed semiconductor laser groups, each of which is made of semiconductor lasers of plural kinds outputting different wavelength beams.

38. (Withdrawn) The image display apparatus of claim 37, wherein each of the semiconductor lasers of plural kinds operates in time-sharing in order to output a beam in time-sharing.

39. (Withdrawn) The image display apparatus of claim 37, wherein the optical switch is a liquid crystal panel, and each of the arrayed semiconductor laser groups is provided to be corresponding to each pixel of the liquid crystal panel.

40. (Withdrawn) The image display apparatus of claim 37, wherein the luminous device includes a surface-emitting semiconductor laser composed of arrayed semiconductor laser groups, each of which is made of semiconductor lasers of plural kinds outputting different wavelength beams.

41. (Withdrawn) The image display apparatus of claim 1, 34 or 35, further comprising a beam- conversion optical system for making

a luminance distribution of beams output from the luminous device to be uniform.

42. (Withdrawn) The image display apparatus of claim 41, wherein the beam-conversion optical system includes an analog phase control element for controlling a beam phase.

43. (Withdrawn) The image display apparatus of claim 42, wherein the analog phase control element is a modified curve surface lens.

44. (Withdrawn) The image display apparatus of claim 1, wherein the parallel-conversion optical system includes a lens array composed of arrayed plural lenses corresponding to the arrayed plural light sources of the luminous device.

45. (Withdrawn) The image display apparatus of claim 44, wherein each of the light sources is located at a position within a focal point of each of the arrayed plural lenses in order to make each of the arrayed plural lenses output beams diverging compared with parallel beams, so that circumference of each of the beams output from the each of the arrayed plural lenses can be overlapped each other.

46. (Withdrawn) The image display apparatus of claim 45, wherein the parallel-conversion optical system includes a single lens for inputting the diverging beams, whose circumference is overlapped, output from the each of the arrayed plural lenses, and outputting parallel beams.

47. (Withdrawn) The image display apparatus of claim 44, wherein at least either of the arrayed plural light sources and the arrayed plural lenses are installed to be movable in order to change a distance between the arrayed plural light sources and the arrayed plural lenses, so that a beam luminance distribution can be changed.

48. (Withdrawn) The image display apparatus of claim 1, wherein the luminous device is an integrated luminous device composed of integrated plural light sources, and the parallel-conversion optical system includes a lens located in order to make a center part of the integrated luminous device be a focal point of the lens.

49. (Withdrawn) The image display apparatus of claim 1, wherein the parallel-conversion optical system includes a transmission type diffraction grating.

50. (Withdrawn) A luminous element comprising a linear polarization element for substantially linearly polarizing an emission light.

51. (Withdrawn) A luminous element comprising a concave reflecting mirror.

52. (Withdrawn) The luminous element of claim 50 or 51, wherein the luminous element is arranged to be an array and used as a luminous device of an image display apparatus.

53. (Withdrawn) The luminous element of claim 52, wherein the luminous element is used as a luminous device of a projection type image display apparatus.

54. (Withdrawn) The luminous element of claim 52, wherein the luminous element is used as a luminous device of a direct-view type image display apparatus.

55. (Withdrawn) The luminous element of claim 50 or 51, wherein the luminous element is an electro-luminescent element.

56. (Withdrawn) The luminous element of claim 50 or 51, wherein the luminous element is a light emitting diode element.

57. (Withdrawn) The image display apparatus of claim 1, wherein the luminous device is a field emission display, and the parallel-conversion optical system is unnecessary.

58. (Withdrawn) The image display apparatus of claim 57, wherein the field emission display also operates as the optical switch, by means of controlling a phosphor emission based on an electron beam on and off.

59. (Withdrawn - Currently Amended) The image display apparatus of claim ~~66, 68 or 69~~74, 76, 77, 78, 80, or 81, wherein the optical switch is a digital micro-mirror device composed of arrayed plural mirrors.

60. (Withdrawn - Currently Amended) The image display apparatus of claim ~~66, 67, 68, or 69~~74, 75, 76, or 77, wherein the luminous device is composed of plural light sources arrayed on a curved surface.

61. (Withdrawn - Currently Amended) The image display apparatus of claim ~~60~~, 66, 67, 68, or 69, wherein the curved surface has its curvature center on an optical axis of beams input into the optical switch.

62. (Withdrawn) The image display apparatus of claim 61, wherein the curved surface is a concave surface.

63. (Withdrawn) The image display apparatus of claim 61, wherein the curved surface is a convex surface.

64. (Withdrawn) The image display apparatus of claim 66, 68, or 69, wherein the optical switch is a liquid crystal panel, a reflection type liquid crystal panel.

65. (Withdrawn - Currently Amended) The image display apparatus of claim 66, 68 or 69, wherein the luminous device has plural light sources, an array shape of which is within a predetermined shape of the optical switch for light utilization.

66. (Withdrawn - Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed plural ~~electro-luminescent elements~~, light sources;

(b) an optical switch for inputting beams output from the luminous device and modulating the beams; and

(c) a display optical system for inputting the beams modulated by the optical switch in order to display an ~~image~~.image,

wherein the luminous device is composed of plural light sources arrayed on a curved surface.

67. (Withdrawn - Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed plural ~~electro-luminescent elements~~, light sources;

(b) ~~a parallel conversion~~ an optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams; and

(c) a display optical system for inputting the beams output from the ~~parallel conversion~~ optical system in order to display an ~~image~~.image,

wherein the luminous device is composed of plural light sources arrayed on a curved surface.

68. (Withdrawn - Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed plural ~~electro-luminescent elements~~, light sources;

(b) an optical switch for inputting beams output from the luminous device and modulating the beams;

(c) an ~~parallel-conversion~~ optical system for inputting the beams modulated by the optical switch, and converting input beams into substantially parallel beams; and

(d) a display optical system for inputting the beams output from the ~~parallel-conversion~~ optical system in order to display an ~~image~~, image,

wherein the luminous device is composed of plural light sources arrayed on a curved surface.

69. (Withdrawn - Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of arrayed plural ~~electro-luminescent elements~~, light sources;

(b) an ~~parallel-conversion~~ optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams;

(c) an optical switch for inputting beams output from the ~~parallel-conversion~~ optical system and modulating the beams; and

(d) a display optical system for inputting the beams modulated by the optical switch in ~~order~~ order to display an ~~image~~ image,
wherein the luminous device is composed of plural light sources arrayed on a curved surface.

70. (Previously Presented) The image display apparatus of claim 34 or 35, wherein the luminous device is composed of a plurality of luminous devices, each of the luminous devices being composed of a plurality of arrayed light sources outputting lights of nearly the same wavelength.

71. (Previously Presented) The image display apparatus of claim 34 or 35, wherein the luminous device is composed of arrayed luminous device groups, each of which is made of light sources of plural kinds outputting lights of different wavelengths.

72. (Withdrawn) The image display apparatus of claim 66, 67, 68 or 69, wherein the luminous device is composed of a plurality of luminous devices, each of the luminous devices being composed of a plurality of arrayed electro-luminescent elements or arrayed light

emitting diode elements outputting lights of nearly the same wavelength.

73. (Withdrawn) The image display apparatus of claim 66, 67, 68 or 69, wherein the luminous device is composed of arrayed electro-luminescent groups or arrayed light emitting diode groups, each of the groups being made of electro-luminescent elements or light emitting diode elements of plural kinds outputting lights of different wavelengths.

74. (Currently Amended) An image display apparatus comprising:

(a) a plurality of luminous devices, each luminous device composed of arrayed plural light emitting diode elements, being composed of a two-dimensional array of light sources, each luminous device being configured to emit light of a different color with respect to other luminous devices;

(b) an optical switch for inputting beams output from the luminous device and modulating the beams; and

(c) a display optical system for inputting the beams modulated by the optical switch in order to display an image-image,
wherein, in each luminous device, each light source outputs light of nearly the same wavelength corresponding to the color of light emitted by the luminous device.

75. (Currently Amended) An image display apparatus comprising:

(a) a plurality of luminous devices, each luminous device being composed of ~~arrayed plural light emitting diode elements~~, a two-dimensional array of light sources, each luminous device being configured to emit light of a different color with respect to other luminous devices;

(b) ~~a parallel conversion~~ an optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams; and

(c) a display optical system for inputting the beams output from the ~~parallel conversion~~ optical system in order to display an ~~image~~.image,

wherein, in each luminous device, each light source outputs light of nearly the same wavelength corresponding to the color of light emitted by the luminous device.

76. (Currently Amended) An image display apparatus comprising:

(a) a plurality of luminous devices, each luminous device being composed of ~~arrayed plural light emitting diode elements~~, a two-dimensional array of light sources, each luminous device being configured to emit light of a different color with respect to other luminous devices;

(b) an optical switch for inputting beams output from the luminous device and modulating the beams;

(c) ~~a parallel conversion~~ an optical system for inputting the beams modulated by the optical switch, and converting input beams into substantially parallel beams; and

(d) a display optical system for inputting the beams output from the ~~parallel conversion~~ optical system in order to display an ~~image~~ image,

wherein, in each luminous device, each light source outputs light of nearly the same wavelength corresponding to the color of light emitted by the luminous device.

77. (Currently Amended) An image display apparatus comprising:

(a) a plurality of luminous devices, each luminous device composed of arrayed plural light emitting diode elements, being composed of a two-dimensional array of light sources, each luminous device being configured to emit light of a different color with respect to other luminous devices;

(b) an ~~parallel conversion~~ optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams;

(c) an optical switch for inputting beams output from the ~~parallel conversion~~ optical system and modulating the beams; and

(d) a display optical system for inputting the beams modulated by the optical switch in order to display an ~~image~~-image,
wherein, in each luminous device, each light source outputs light of nearly the same wavelength corresponding to the color of light emitted by the luminous device.

78. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of ~~arrayed plural light emitting diode elements~~,a repeating set of light source arrays;

(b) an optical switch for inputting beams output from the luminous device and modulating the beams; and

(c) a display optical system for inputting the beams modulated by the optical switch in order to display an ~~image~~-image,
wherein each light source array is composed of a plurality of light sources outputting light of different wavelengths.

79. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of ~~arrayed plural light emitting diode elements~~,a repeating set of light source arrays;

(b) ~~a parallel conversion~~ an optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams; and

(c) a display optical system for inputting the beams output from the ~~parallel-conversion~~ optical system in order to display an ~~image-image~~,

wherein each light source array is composed of a plurality of light sources outputting light of different wavelengths.

80. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of ~~arrayed plural light emitting diode elements~~, a repeating set of light source arrays;

(b) ~~a parallel-conversion~~ an optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams;

(c) an optical switch for inputting beams output from the ~~parallel-conversion~~ optical system and modulating the beams; and

(d) a display optical system for inputting the beams modulated by the optical switch in order to display an ~~image-image~~,

wherein each light source array is composed of a plurality of light sources outputting light of different wavelengths.

81. (Currently Amended) An image display apparatus comprising:

(a) a luminous device composed of ~~arrayed plural light emitting diode elements~~, a repeating set of light source arrays;

(b) a ~~parallel-conversion~~ an optical system for inputting beams output from the luminous device, and converting input beams into substantially parallel beams;

(c) an optical switch for inputting beams output from the ~~parallel-conversion~~ optical system and modulating the beams; and

(d) a display optical system for inputting the beams modulated by the optical switch in order to display an ~~image~~-image,

wherein each light source array is composed of a plurality of light sources outputting light of different wavelengths.